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BY THE COMPTROLLER GENERAL

Report To The Chairman, Subcommittee On Defense, Committee On Appropriations, House Of Representatives

OF THE UNITED STATES

DOD Has Serious Problems With Care And Maintenance Of Conventional Ammunition

COMPLETED

Significant problems exist among the military services concerning the adequacy with which conventional ammunition is being stored, maintained, and renovated. The Army has a large backlog of ammunition in need of renovation, the Navy's ammunition accountability is inadequate and records often cannot be relied on to depict the actual quantity and condition; and the Air Force's use of open storage at its depots in Europe has caused ammunition to deteriorate faster than needed maintenance can be performed.

GAO believes the Department of Defense and the military services must act immediately to prevent further degradation of ammunition stocks.

PLRD-82-27
FEBRUARY 9, 1982

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-205918

The Honorable Joseph P. Addabbo
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Your September 30, 1980, letter asked us to review the military services' justification for their fiscal year 1982 appropriations requests for the procurement of conventional ammunition and the ammunition production base. You also requested that we make some followup inquiries to determine the status of the Department of Defense actions regarding the single manager for conventional ammunition. In addition, you asked that we review the adequacy of the programs under which ammunition is stored and maintained by the services.

Our report regarding ammunition procurement and the single manager was provided to you on June 30, 1981. This report addresses the care and maintenance of conventional ammunition.

As requested, we reviewed the programs of the Army, Navy, and Air Force in both the United States and at overseas locations. On the basis of our evaluations, we are making various recommendations to the services to reduce the ammunition renovation and maintenance backlogs and improve storage operations.

On October 9, 1981, we gave your Office a draft of this report to be used during the Committee's markup of the Defense appropriations bill. Also, with your permission, we testified on this report before the House Committee on Government Operations on November 18, 1981. This final report incorporates the Department of Defense comments on the draft report.

As arranged with your Office, we are sending copies of this report to the Chairmen, House Committees on Armed Services and on Government Operations and Senate Committees on Appropriations, on Armed Services, and on Governmental Affairs;

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the Director, Office of Management and Budget; and the Secretaries of Defense, the Army, the Navy, and the Air Force. Copies will be made available to other interested parties upon request.

Sincerely yours,

Milton J. Socolar

Acting Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT
TO THE CHAIRMAN, SUBCOMMITTEE
ON DEFENSE, COMMITTEE ON
APPROPRIATIONS,
HOUSE OF REPRESENTATIVES

DOD HAS SERIOUS PROBLEMS WITH CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION

D I G E S T

At the request of the Chairman, Subcommittee on Defense, House Committee on Appropriations, GAO has reviewed various aspects of the military services' care and maintenance programs for conventional ammunition to determine

--if there are problems with the storage, preservation, and renovation of conventional ammunition,

--how significant the problems are, and

--what the services are doing to correct the problems.

The military services are experiencing significant problems in the storage, maintenance and renovation of ammunition. For example:

--The Army has embarked on a concentrated program, involving substantial funding, to alleviate what it considers a serious backlog of ammunition needing renovation. However, GAO found that the Army's estimate of the seriousness of the problem is based on an undocumented assumption as to the types and quantities of ammunition needing attention. (See p. 5.)

--The Army's currently inadequate maintenance and storage facilities are causing a serious backlog of ammunition in need of maintenance in Europe. (See pp. 6 and 8.)

--The Army does not currently have sufficient storage facilities to provide adequate protection for ammunition needed to meet its long-range requirements in Europe. (See p. 11.)

--The Navy's ammunition accountability is inadequate and recorded data often cannot be relied on to depict the true quantity and condition of the ammunition. (See p. 13.)

--The Navy does not have an effective quality assurance surveillance program for inspecting its ammunition in the Pacific. (See p. 15.)

--The Navy's interface with the single manager for conventional ammunition is a continuing problem in regard to ammunition accountability and performance of maintenance and renovation of ammunition stored in Army facilities. (See p. 17.)

--The Navy's funding for ammunition maintenance and renovation has not kept pace with requirements, resulting in backlogs of needed work. (See p. 17.)

--The Air Force's use of open storage at its depots in Europe has caused ammunition to deteriorate faster than needed maintenance can be performed. (See p. 21.)

To correct or alleviate these problems, GAO recommends that the Secretary of the Army:

--Determine and base future funding requests on the specific types and quantities of ammunition actually needing renovation, rather than basing long-range plans and budgets on an undocumented general assumption as to the condition of the ammunition in storage.

--Closely monitor the acquisition of needed additional ammunition maintenance and storage capabilities in Europe and take action to avoid slippages. (See p. 12.)

GAO recommends that the Secretary of the Navy:

--Determine the level of unserviceable ammunition which should be renovated and support a budget program to reduce the backlog of unserviceable ammunition.

--Emphasize or revise the quality assurance surveillance program to provide adequate inspections of ammunition at storage locations. (See p. 19.)

GAO recommends that the Secretary of the Air Force:

--Closely monitor the acquisition of needed additional ammunition storage and maintenance capability in Europe and take action to avoid slippages which would result in continued deterioration of ammunition and further accumulation of maintenance backlogs. (See p. 23.)

Defense reviewed this report and generally concurred with GAO's findings and recommendations. Comments have been incorporated in the report where appropriate. (See pp. 12, 20, and 23.)

Defense officials did not agree that the Army was using an undocumented general assumption as the basis for their funding requests and renovation plans. They contend that these plans and requests are based on past experience and offered to provide documentation to support their position. However, this documentation had not been provided as of February 2, 1982. (See p. 12.)

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ABBREVIATIONS

CAIMS	Conventional Ammunition Inventory Management System
GAO	General Accounting Office
MAERU	Mobile Ammunition Evaluation and Reconditioning Unit
MCA	Military Construction, Army
NATO	North Atlantic Treaty Organization

CHAPTER 1

INTRODUCTION

Because most ammunition is produced long before its ultimate consumption, it is important that the material be adequately stored and maintained to remain usable. It must be capable of delivering all of its destructive force upon a selected target without unreasonable hazard to the user. It is this consideration that creates a need for proper attention to storage, preservation, maintenance, and renovation of ammunition.

The military services' inventories of conventional ammunition are large and represent considerable investments. As of September 30, 1980, these inventories, valued at $18 billion, totaled about 4.2 million short tons.

Location	Conventional ammunition on hand			
	Army	Navy	Air Force	Total
	(short tons)			
Continental United States	1,032,053	740,624	550,000	2,322,677
Europe/ Atlantic	760,191	128,604	160,000	1,048,795
Pacific	453,424	145,752	160,000	759,176
Other	38,147	-	-	38,147
Total	2,283,815	1,014,980	870,000	4,168,795

In the continental United States, the Army, acting as the single manager for conventional ammunition, is responsible for the management of wholesale level ammunition--items owned by the inventory control point--for all services. This ammunition is stored at Army installations under the command of either the U.S. Army Depot System Command or the U.S. Army Armament Materiel Readiness Command, both of which are subordinate commands of the U.S. Army Materiel Development and Readiness Command. Retail level ammunition--items owned by the major and subordinate commands--both in the United States and overseas, is generally stored and maintained at installations of the owning service.

CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION

Unlike some other material, ammunition maintenance requirements cannot be determined on the basis of predetermined yardsticks, such as flying hours, miles driven, or hours of operation. The degree of maintenance required for ammunition is

dependent on the extent of physical deterioration detected during surveillance inspections or malfunctions of similar ammunition items during use or testing.

Periodic surveillance of stored ammunition is required to detect corrosion and other signs of deterioration as early as possible so that maintenance action can be taken to prevent its serious degradation. Ammunition maintenance can range from normal preservation, derusting, repainting, and repacking to more complex operations of disassembly, replacement or repair of components, and reassembly. The lesser degree of maintenance is normally required in order for the ammunition to have the capability to withstand long-term storage without degradation. Renovation, the more complex form of maintenance, is required to correct deficiencies affecting safety or reliability. Failure to perform needed renovation could result in malfunctions causing death or serious injury to the user or extensive property damage and loss of expensive weapons and equipment.

Responsibility for performing and funding the storage, surveillance, and routine maintenance functions rests with the organization having physical custody of the ammunition. The owning service, that is, the Army, Navy, or Air Force, is responsible for funding the renovation of ammunition, even if it is in the custody of another service.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives for this review were to:

--Determine if the military services are experiencing problems in the storage, maintenance, and renovation of conventional ammunition and, if so, how significant the problems are.

--Determine what the services are doing to correct the problems.

We contacted military headquarters, commands, units, depots, and ammunition storage points in the United States, Europe, and the Pacific. (See app. I.) These 56 organizations were selected because they had either command responsibility for management of conventional ammunition or significant amounts of ammunition stored. In addition, these locations provided wide geographic dispersion.

Because of the large number of activities visited, we did not have time to perform indepth, detailed reviews at each organization. For this reason, the data we gathered was not based on a scientific random sampling of ammunition storage locations, conditions, or quantities, but rather judgment samples designed to illustrate the problems and impacts involved

and to give the broadest possible coverage in the available time. Because of our broad coverage of the services' locations, we believe the information developed reflects conditions that would be found worldwide.

Generally, we reviewed the methods and techniques Defense uses in managing the care and maintenance programs for its conventional ammunition. This included physical examination of storage facilities and selected ammunition items stored in these facilities. We evaluated the adequacy of the facilities and the services' quality assurance programs which monitor the condition of ammunition in storage. In addition, we reviewed accountability procedures to determine if various management levels were being provided reliable data on the location, quantity, and condition of ammunition in storage. Finally, we evaluated the services' funding efforts as they related to the care and maintenance of conventional ammunition.

We restricted our review, as much as possible, to the two objectives mentioned previously. We did not attempt, for example, to determine the reasons storage facilities were in various states of disrepair or evaluate the amount of funding received for care and maintenance of conventional ammunition at individual military bases. We also did not evaluate safety and security measures at the storage locations or question any of Defense's ammunition requirements or stockage objectives. In order to keep the report unclassified, specific data related to type, quantity, location, and condition of certain ammunition has been omitted.

CHAPTER 2

PROBLEMS ASSOCIATED WITH THE CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION--DEPARTMENT OF THE ARMY

The Army said that its backlog of conventional ammunition in need of renovation is at an unmanageable level. It has embarked on a concentrated funding program to compensate for what it considers past inadequate funding and to reduce the backlog to a manageable level by fiscal year 1985. However, we question the accuracy of the Army's estimates of its renovation backlog and related funding needs because they were based on an undocumented assumption concerning the actual condition of a substantial amount of ammunition.

Inadequate maintenance and storage facilities in Europe are causing a serious backlog of ammunition needing maintenance. Ammunition stored in poorly designed and structured facilities has deteriorated at rates beyond the Army's capability to provide needed maintenance.

Also, the Army does not expect to have sufficient storage facilities to provide adequate protection for conventional ammunition needed to meet its long-range requirements in Europe, until fiscal year 1989.

RENOVATION BACKLOG

As of September 30, 1980, the Army estimated that it had more than 111,000 tons of conventional ammunition needing renovation. Army officials said that a backlog of 33,000 tons is manageable. Therefore, the actual backlog, as estimated by the Army, is far in excess of a manageable level.

Backlog attributed to inadequate funding in previous years

Army officials attribute the sizable backlog of ammunition needing renovation to inadequate funding in previous years.

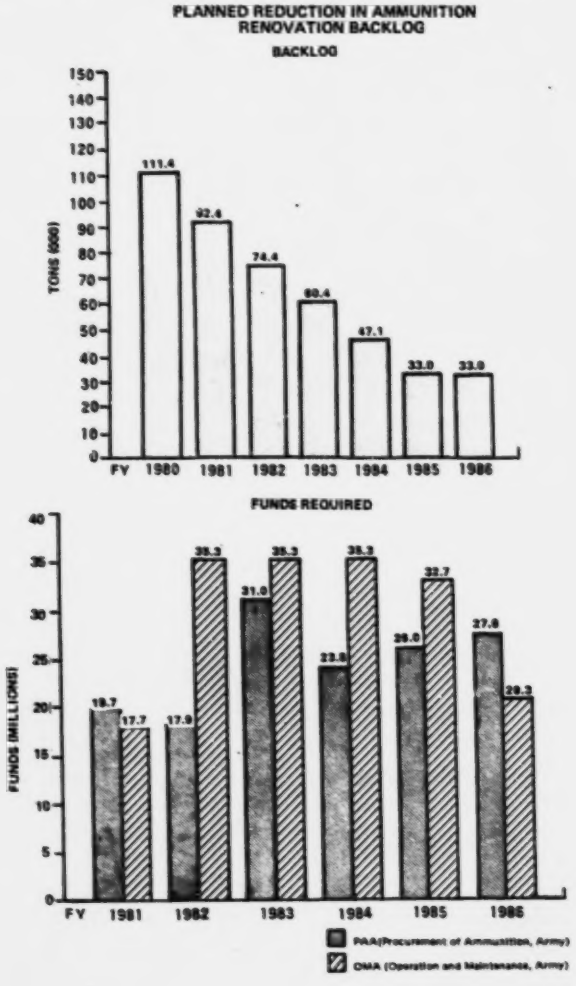
An official of the Army's Office of the Deputy Chief of Staff for Logistics told us that for fiscal year 1979, the Army included in its operation and maintenance budget request $17.6 million for renovation of conventional ammunition. However, after receipt of that year's appropriation, Army funded this program for only $8.9 million. Similarly, for fiscal year 1980, the Army requested $24.5 million; however, Army officials approved $14.7 million for the program.

The Army's testimony for fiscal year 1981 funds indicated that its program to eliminate the renovation backlog was underfunded by $14.8 million. The House Committee on Appropriations said that the Army should place high priority on taking care of the ammunition it already has, as well as procuring new ammunition. Therefore, this Committee recommended an increase of $14.8 million in the fiscal year 1981 appropriation bill and said that these funds should be used to alleviate the backlog.

Army program to alleviate renovation backlog

The Army plans to reduce its renovation backlog to 33,000 tons per year by the end of fiscal year 1985. Once the backlog has been reduced to 33,000 tons, the Army estimates that $20 million in operations and maintenance funds will be needed each year to maintain the backlog at that level.

Shown below is the anticipated backlog reduction and the Army's estimates of required funding to meet the 1985 goal.



Estimated size of backlog and funding requirement are questionable

As stated earlier, the Army estimated that as of September 30, 1980, it had more than 111,000 tons of ammunition needing renovation. We could not validate this estimate.

Ammunition needing renovation should generally be classified in condition code F, while ammunition needing only minor maintenance should normally be classified in condition code E. The U.S. Army Armament Materiel Readiness Command provided documentation to support the estimated 111,000 ton backlog. In examining this documentation, however, we found that 69,300 tons, or 62 percent, of the ammunition included in the renovation backlog were classified in condition code E, for which renovation funding should not normally be needed. When we inquired about this apparent anomaly, we were told that the Army officials who made the estimate, assumed, based on their past experience, that 50 percent of Army ammunition classified in code E would require renovation funding. This assumption was applied across the board, Army-wide, to all items of conventional ammunition.

Army officials could not provide us any studies, data, or other documentary support for their assumption that 50 percent of the ammunition in condition code E would actually require renovation. However, during our visits to storage sites, we made a limited evaluation of the accuracy of condition codes assigned to ammunition in storage by asking service technicians to inspect and classify ammunition items by condition code. We evaluated 147 items and found only eight instances in which the originally assigned condition codes were incorrect. Admittedly, our sample was small, and therefore, not conclusive. However, it did not support the Army's assumption.

CURRENT MAINTENANCE CAPABILITY IN EUROPE CANNOT KEEP PACE WITH NEW GENERATIONS OF UNSERVICEABLE AMMUNITION

The Army's present maintenance capability in Europe cannot keep pace with the new generations of unserviceable ammunition anticipated in the future. If currently planned increases in maintenance capability are realized, this situation should begin to be corrected in fiscal year 1984. However, if the increased maintenance capability is not acquired or is delayed, the backlog of ammunition needing maintenance will continue to increase.

The Army in Europe estimates that 67,000 tons of its ammunition would need maintenance at the end of fiscal year 1981, and that an additional 20,000 tons would accumulate each year. The ammunition needing maintenance can be treated in three ways:

--Items with only minor defects can be used for training.

--Some items can be retrograded to the United States for disposition.

--The remainder of the items can be made serviceable at maintenance facilities in Europe.

The first two options, use for training and retrograde to the United States, result in only limited reductions, averaging only about 3,000 and 2,000 tons per year, respectively. Therefore, the bulk of the ammunition items must be made serviceable at maintenance facilities in Europe.

At present, the Army has two primary ammunition maintenance facilities in Europe--Miesau Army Depot in Germany and Caerwent Army Depot in the United Kingdom. Together, Miesau and Caerwent were able to make serviceable an average of 16,455 tons of ammunition each year from fiscal years 1973 through 1979. However, during this period, these depots were unable to keep pace with the increasing maintenance backlog.

The Army processed a record 26,000 tons of unserviceable ammunition through its European maintenance facilities in fiscal year 1980 and expected to process 25,000 tons in fiscal year 1981. These figures, however, are not representative of the long-range capability of these facilities because much of the maintenance was performed on high-tonnage items, such as 155-mm. and 8-inch projectiles, and not labor-intensive items. As work is performed on more labor-intensive items and/or items of less weight, the production tonnage figures will be reduced.

At the time of our review, the Army projected that its backlog of ammunition needing maintenance in Europe, considering its present maintenance capability, would increase as shown below.

FY	Amount (tons)
1981	67,000
1982	64,000
1983	68,000
1984	74,000
1985	78,000
1986	81,000
1987	84,000

Army officials informed us that they plan to construct additional maintenance facilities in each of the Corps areas,

at the 84th Ordnance Battalion, and in the BENELUX area, which will enable them to keep pace with future generations of unserviceable ammunition. These additional facilities, to be funded either by the North Atlantic Treaty Organization (NATO) or the Military Construction, Army (MCA), appropriation are shown below.

Location	Type of facility/building	Type of funding	Complete in FY
Bertrix	Maintenance	NATO	1985
Twisteden	Maintenance/Surveillance	NATO	1985
Koeppern	Maintenance	MCA	1985
Vielbrunn	Maintenance/Surveillance	MCA	1987
Kreigsfield	Maintenance	MCA	1988
Muenster	Maintenance/Surveillance	MCA	1988

If these additional facilities are constructed as planned, the Army projects that its backlog of ammunition needing maintenance will be reduced as shown below.

FY	Amount (tons)
1981	67,000
1982	64,000
1983	68,000
1984	74,000
1985	74,000
1986	69,000
1987	60,000

A comparison of the two projections shows that the construction of additional maintenance facilities is critical to controlling the backlog. Therefore, failure to construct them could result in a continually increasing backlog of ammunition needing maintenance.

SUBSTANDARD STORAGE FACILITIES IN EUROPE ACCELERATE THE DETERIORATION PROCESS

Ideally, ammunition should be stored in humidity-controlled warehouses and earth-covered igloos which safeguard casings and fuzes from excessive temperature fluctuations, inclement weather,

and other corrosive elements. For the most part, the Army's physical storage facilities in the United States and in the Pacific theater provide the needed protection. Ammunition did not appear to be deteriorating due to poor storage conditions. The same cannot be said, however, for Army ammunition pre-positioned in European storage depots. In Europe, ammunition is stored in a variety of facilities, many of which are "make-do" type buildings that were not designed for storing ammunition. Other facilities have deteriorated to the point that they no longer adequately protect the ammunition.

We toured storage facilities at the Army's largest ammunition storage area at Miesau and Weilerbach in West Germany. We also examined storage conditions at Caerwent Army Depot in South Wales and Camp Darby in Northern Italy. The storage facilities and the ammunition at Camp Darby are both relatively new and in excellent condition. But, as discussed below, at Caerwent and Miesau, we found large quantities of ammunition were subjected to poor storage conditions, which accelerated deterioration.

Caerwent Army Depot

Caerwent Army Depot currently stores about 78,000 short tons of ammunition. Nearly 47,000 tons consist of such items as 155-mm. and 8-inch projectiles. Much of this ammunition has corroded repeatedly to an unserviceable condition because it was stored in damp, deteriorated buildings. A number of storage buildings have no windows or doors and the projectiles are exposed directly to the full range of weather conditions. Although the buildings were not originally designed to store ammunition, they were modified between 1969 and 1971 for this purpose. Today, the original buildings are in varying states of disrepair. Many have leaking ceilings and walls. Some have structural defects and water inside the storage area.

We traced the maintenance history of one lot of 8-inch, high-explosive projectiles stored in these buildings to illustrate the corrosion problem.

--November 1954. Lot IOP-9-15 was manufactured at an Iowa ordnance plant and remained in good condition until about April 1968.

--October 1969. Caerwent Army Depot received 30,657 rounds from France. An inspection of the ammunition determined that all had minor to medium rusting. The lot was placed in condition code E (in need of minor repair) and a request was put forward to process the entire lot for derusting, repainting, and restenciling.

--October 1969 to June 1973. Periodic inspections of the lot continued over the next 3-1/2 years. Maintenance

apparently began around June 1973 and was completed in January 1974. All of the projectiles were sandblasted, reprimed, restenciled, and repacked on new pallets. Sixty-seven rounds could not be restored and were destroyed. The ammunition was then returned to storage.

--December 1977. Within 3 years, inspections indicated the lot had rusted to the point it again required complete reconditioning.

--September 1980. Maintenance was completed on the entire lot. Projectiles were again sandblasted, reprimed, repainted, and restenciled. This time, 659 projectiles could not be restored because holes had rusted through the bottom of the rounds. The projectiles were once again returned to their original storage locations. It is expected this ammunition will require maintenance again, as early as 1983, if storage conditions are not improved.

Dry storage is essential to these type projectiles. The base plate on this ammunition, which is only .031 of an inch thick, is a critical component which cannot withstand repeated rusting and sandblasting. In the lot examined, over 700 rounds were lost because of rusted base plates. Surveillance experts told us that projectiles of this type should not rust for a minimum of 10 years when stored properly.

Miesau Army Depot

Miesau Army Depot is the Army's largest, and most active, overseas ammunition depot. Including the nearby Weilerbach storage area, Miesau encompasses 5,000 acres and stores approximately 210,000 short tons of ammunition. This is over half of all ammunition in the rear combat zone.

Ammunition is stored in 690 earth-covered igloos and approximately 786 above-ground huts. These structures are 25 to 30 years old and are in varying states of disrepair. During a tour of the facilities, we observed storage igloos that were wet throughout, including the ceilings and walls. The Chief of the Facilities Division at Miesau stated that considerable amounts of money had been spent in past years for spot repairs but that most of the igloos needed to be completely renovated.

Above-ground huts were an even bigger problem. These huts were built 30 years ago as temporary structures and about half are in varying degrees of deterioration. Some of the huts have large holes in the exterior walls and/or doors which exposes the stored ammunition to all weather conditions. Leaking roofs were also prevalent.

Conditions such as those described above greatly affect the Army's ammunition maintenance programs. In recent years deterioration has escalated beyond the Army's maintenance and renovation capabilities, resulting in significant backlogs.

ARMY DOES NOT HAVE SUFFICIENT CAPACITY IN EUROPE TO MEET ITS STORAGE NEEDS

In 1978 the Army Chief of Staff planned to have the Army's requirement for prepositioned war reserves of conventional ammunition in Europe by the end of fiscal year 1983, if the Congress continued to fund a major portion of the required storage capacity in Europe. However, the Congress in passage of the fiscal year 1979 Military Construction Act, reduced the Army's funding request for ammunition sites in Europe by $17 million and stated that future funding for this purpose should be obtained from the NATO Infrastructure Program.

During our review, the Army estimated that 70 percent of needed capacity would be available at the end of fiscal year 1983, based on currently funded military construction programs, and considering ammunition storage capacity which was scheduled to become available through fiscal year 1983 from renovation of old storage sites and other anticipated funding. Based on the most optimistic expectations for NATO funding, the Army does not anticipate availability of needed storage capacity until fiscal year 1989, as shown below.

FY	Anticipated capacity (percent)
1983	70
1984	71
1985	72
1986	73
1987	80
1988	95
1989	100

Achievement of the above timetable is dependent on prescribed levels of NATO funding. Any slippages or reductions in this funding will further delay the time when the stockage objectives will be met.

CONCLUSIONS

The Army is requesting funds to alleviate what it considers a serious backlog in ammunition needing renovation. However, the fund request is not based on knowledge as to the actual quantities of specific types of ammunition needing renovation.

Serious problems exist in the storage of conventional ammunition in Europe. Inadequate facilities have caused much ammunition to deteriorate faster than the Army can provide needed maintenance. Further, the Army will not have sufficient storage capacity to satisfy its long-range requirements until fiscal year 1989.

RECOMMENDATIONS

To alleviate the problems discussed above, we recommend that the Secretary of the Army:

--Determine and base future funding requests on the specific types and quantities of ammunition actually needing renovation rather than basing long-range plans and budgets on an undocumented general assumption as to the condition of the ammunition in storage.

--Closely monitor the acquisition of needed additional ammunition maintenance and storage capabilities in Europe and take action within the limits of available funds to avoid slippages.

AGENCY COMMENTS

Defense agreed with our recommendations concerning the need to closely monitor the Army's acquisition of additional maintenance capability for Europe. Officials informed us that U.S. Army Armament Materiel Readiness Command is working closely with the U.S. Army, Europe, to ensure that the European maintenance program is workable and that certain needed maintenance equipment has been, or is being, procured.

Defense also agreed with our recommendation relating to the need to closely monitor acquisition of additional storage capability for Europe. Officials informed us that acquisition of this capability is of primary concern and is being actively monitored. Defense also told us that shipments of ammunition to Europe will be tailored to the available storage capability to ensure safeguarding and to help prevent deterioration of the ammunition.

Defense did not agree that the Army was using an undocumented general assumption as to the condition of their stored ammunition as the basis for their long-range renovation plans and funding requests. They claim that past experience has shown that about 50 percent of ammunition classified as being in condition code E actually required renovation rather than minor maintenance. On October 30, 1981, these officials indicated that they could and would provide us documentation to support their contention. No such documentation had been provided as of February 2, 1982.

CHAPTER 3

PROBLEMS ASSOCIATED WITH THE CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION-- DEPARTMENT OF THE NAVY

Although the Navy generally has adequate storage facilities for its conventional ammunition both overseas and in the United States, it is experiencing problems in the care and maintenance of its stocks. For example, we found that:

--Ammunition accountability is inadequate and recorded data cannot be relied upon to depict the true quantity and condition of ammunition in storage.

--The Navy does not have an effective quality assurance program for inventorying and inspecting its ammunition stored in the Pacific.

--The Navy has a continuing problem interfacing with the single manager for conventional ammunition not only in inventory accountability but in the maintenance and renovation of ammunition.

--Funding for maintenance and renovation of stocks has not kept pace with requirements, resulting in rework backlogs.

NAVY HAS POOR ACCOUNTABILITY AND CONDITION DATA ON STORED AMMUNITION

The Navy's accountable records often do not show the actual quantities or the true condition of ammunition in storage. Its Conventional Ammunition Inventory Management System (CAIMS) does not provide the required accountability to control large inventories of ammunition. CAIMS, which tracks items to the command level, is updated by data received from the local station records.

In a recent study of naval ammunition accountability, we reported 1/ that based on inventories conducted at two naval weapons stations in the continental United States, $7.4 million of ammunition shown on the accountable records could not be found. In addition, ammunition valued at $1.4 million was found in storage but was not on the accountable records.

In the Pacific, we inspected ammunition storage sites at the Naval Magazine Lualualei, Hawaii, and the Naval Magazine

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1/"The Navy Must Improve Its Accountability For Conventional Ammunition" (PLRD-81-54, July 29, 1981).

Subic Bay, Philippines. At Lualualei, we found many discrepancies between the records and the items actually stored in 11 magazines. For example, the records at one magazine indicated that it contained 307 bomb bodies, we found only 295. In the same storage area, the records showed there were 480 bombs, but our search disclosed only 474. In yet another magazine, the records showed an inventory of 504 bombs, but we found 606 were actually on hand.

Even worse conditions were observed at the Naval Magazine Subic Bay. We found records grossly inaccurate and accountability virtually lost. An inventory in process at the time of our visit indicated a 70-percent error rate in account balances, notwithstanding the fact that the account balances had been established based on a wall-to-wall inventory conducted 2 years earlier. Further evidence of accountability problems is demonstrated by the $8.5 million inventory gain and loss adjustments made at the facility from October 1979 through December 1980. For example, during this period the magazine reported

--a gain of 178 target detecting device fuzes	$ 16,198
--a loss of 489 5-inch rocket motors	122,250
--a loss of 3 training missiles	105,000

At the time of our visit, a report was being processed to show a loss of 159 cluster bomb units and dispensers valued at $503,000.

We also identified accountability problems at the storage facilities in Europe. For example, at one location we found errors in 8 of 24 line items in storage. One item was found to have twice the quantity shown on the records, adding $106,000 to the inventory. We also detected numerous discrepancies between the inventory data shown in CAIMS reports and the quantities and condition of ammunition in storage. Officials said they reconciled their records with CAIMS each month but only one location had annotated its records to show such reconciliations. After our visit, the manager at one depot sent three messages to update CAIMS for 43 line items. Some of these corrections should have been made 2 or 3 years earlier.

In addition to accountability problems, we found that records did not accurately show the true condition of stored items. This was particularly true at the locations visited in the Pacific. For example, we noted that condition code cards for items stored at both Lualualei and Subic Bay (1) did not show the items actual condition, and (2) were not accessible to inspection personnel. In some case, items did not have condition code cards. In addition, at Subic Bay many condition code cards had been exposed to the weather and were

unreadable. The following observations illustrate these points.

--An open storage area at Subic Bay contained 651 cluster bomb units supposedly in condition code A (ready for issue). Numerous containers were rusty and had rusty clamps and bolts. The containers had been stored in the area since 1979 and the condition code cards showed that they were last inspected in 1976-77. According to the quality assurance department director, at least 50 percent of the units should be classified either condition code E (needing minor renovation) or F (repairable). Ammunition bearing these codes are not generally considered ready for issue.

--At both locations the contents of some magazines were stored in such a way that visual quality assurance inspections would be impossible. Adequate passage-way for visual inspections were not always available and some inert items were stacked so high it would be impossible to inspect items without first moving them.

--At Lualualei, condition code cards were missing or inaccessible in 7 of 11 magazines and storage areas we inspected. Several pallets in one of the magazines contained bombs with surface rust. Their condition code cards, which classified them as code A (ready for issue), were dated sometime in 1961.

Conditions such as those cited above obviously aggravate quality assurance inspection programs which need improvement in the Pacific.

QUALITY ASSURANCE SURVEILLANCE NEEDS STRENGTHENING

The Navy has problems with its quality assurance inspection program. It believes that the Army single manager does not adequately inspect and condition code Navy wholesale stocks in the United States. We found severe problems in the Navy's quality assurance programs in the Pacific.

The Navy has established Mobile Ammunition Evaluation and Reconditioning Units (MAERU), which are periodically sent to naval magazines overseas, to inspect, test, and renovate selected items. We did not evaluate the efforts of these units in our study, but we did visit several locations in Europe where these units had inspected and reconditioned stocks, and their efforts were commendable. In-house quality assurance operations at overseas storage sites is another matter, particularly in the Pacific.

Neither the Lualualei or Subic Bay storage activity had adequate quality assurance programs to inspect, test, and recondition their stocks. The official responsible for quality assurance at Lualualei told us that quality assurance inspections had not been performed in the individual magazines since the facility was deactivated as a depot in 1974. He said that since the size of the quality assurance staff was reduced in 1974, he does not have sufficient staff to perform this function. The quality assurance official at Subic Bay told us that his staff had conducted some inspections but that they were reviews of storage conditions and housekeeping functions in and around the magazines as opposed to surveillance of the ammunition stored therein. Subic Bay also lacks sufficient staff to perform surveillance in the magazines on a systematic basis. The director of the quality assurance department estimated that five more inspectors would be needed to effectively do the job. We inquired about MAERU visits to the facilities and were told that the last time a MAERU did renovation work at Lualualei was in 1976 but that a team had visited in 1978 to inspect some bomb clusters. A MAERU had also visited Subic Bay in late 1976, early 1977.

Officials at Subic Bay did not believe the MAERUs were the solution to their surveillance and maintenance problems. They believed the effectiveness of the MAERUs was limited because (1) of the time between their visits--2 to 4 years and (2) their interest was generally limited to preselected assets and/or lots rather than the entire stock. One official believed it would be less costly and more effective for Subic Bay to obtain the staff and facilities necessary so it could do the kind of testing that the MAERUs perform, but on a continuous basis.

Unlike the Army and Air Force, the Navy does not have career specialists in ordnance to manage its magazines. In our opinion, many of the weaknesses in the Navy's management of ammunition at both Lualualei and Subic Bay are directly related to Navy policy of assigning military personnel who lack sufficient ordnance training and expertise to manage its magazines. At Subic Bay, for example, only two of the six officers holding key positions had any experience in ordnance management prior to being assigned to the magazine. One officer had 4 years of experience and the other had only 2. Enlisted personnel were assigned to that facility because they had requested general shore duty in the Philippines--usually in connection with their reenlistment--not because of their training and experience. Inexperienced personnel suddenly find themselves trying to manage or carry out important functions for which they lack both training and expertise. The lack of experience and training appears to be compounded by the lack of continuity that results from the turnover of military personnel, which occurs about every 2 years.

Officials at both magazines said their problems are due, in part, to the lack of experience of those managing and working their facilities. The Commanding Officer at Subic Bay told us that schools had been identified to which officers and enlisted personnel could be sent for training, but that the Navy had no funds available for that purpose.

NAVY INTERFACE WITH THE SINGLE MANAGER FOR CONVENTIONAL AMMUNITION IS A PROBLEM

On October 1, 1977, the Army became the single manager for conventional ammunition. At that time, the Navy transferred wholesale inventory management responsibility for its air munitions and ship gun ammunition to the single manager. The Navy maintained financial accountability for these assets.

The Navy has not been able to reconcile its ammunition inventory records with those of the single manager. In April 1980 the Navy's CAIMS records were adjusted downward by $46 million to aline Navy with the single manager's records.

The single manager procures most of the Navy's conventional ammunition and stores it at the single manager's depots and at Army depots operated by the Depot System Command. In our July 29, 1981, report, we found that an additional $3.5 million downward adjustment would be required to aline CAIMS with the inventory at just one single manager storage site. We tested records at the Letterkenny Army Depot and found discrepancies on items listed by both the Navy and the single manager. For example, the CAIMS records showed 326 primers in condition code A (ready for issue) while custodial Army records showed 1,786 primers in condition code B (issuable with qualifications). We also identified ammunition items listed on the Navy's records but not on the Army's records and vice versa. For example, Army records showed 360 adapters in condition code A while CAIMS had no record of this item in the inventory. In another case, CAIMS showed 3,376 5-inch projectiles stored at Letterkenny depot, but the depot did not show this item in its inventory records.

The Navy funds the renovation cost on its reparable ammunition that is performed by the single manager at single manager storage locations. The single manager, on the other hand, funds and performs quality assurance inspections and pays for minor maintenance involving limited restoration. The Navy informed us that there is a continuing problem with the condition coding of Navy ammunition issued from Army depots.

INADEQUATE FUNDING FOR MAINTENANCE AND RENOVATION

The Navy's funding for maintenance and renovation of ammunition has not kept pace with its needs to place unserviceable

ammunition in a ready-for-issue condition. In June 1980 the Navy's worldwide ammunition inventory was valued at $6.7 billion. About $3.7 billion was stored at major storage activities in the continental United States and the remaining $3 billion was distributed to fleet vessels and overseas bases. Of the $3.7 billion stored at major storage activities, about $2 billion was in an unserviceable condition.

The single manager for conventional ammunition provides renovation on Navy-owned conventional ammunition based on priorities established by the Naval Air Systems Command for conventional air ammunition and the Naval Sea Systems Command for conventional surface and underwater ammunition. To determine which items and how many will be budgeted for renovation, the Commands compare the percentage of on-hand serviceable assets to the inventory objective. Priorities for renovation are then determined on the percent of mission readiness.

The CAIMS inventory data is the primary source for Navy budget computations. As previously pointed out, the ammunition accountability in CAIMS is questionable. Budgets for conventional ammunition are formulated at the command level and reviewed by the Naval Materiel Command, the Chief of Naval Operations, the Navy Comptroller, the Office of the Secretary of Defense, and the Office of Management and Budget.

Even though the Navy Commands may originally prepare budget requests which are responsive to their ammunition renovation needs, these original requests may be substantially reduced through the budget review process. For example, the Naval Sea Systems Commands' fiscal year 1980 request for renovation and maintenance funds for ammunition totaled $13.2 million. This request was immediately reduced to $9.6 million by the Navy Comptroller and further reduced to $7.8 million by the Office of the Secretary of Defense. The final fiscal year 1980 congressional budget submission for ammunition renovation and maintenance was $7.5 million.

Almost a third of the Navy's $6.7 billion inventory of ammunition was reported to be in an unserviceable condition in June 1980, yet requirements for ammunition maintenance are funded at levels below that needed to meet total requirements.

CONCLUSIONS

The Navy needs to improve its accountability and control over conventional ammunition. It is not adequately managing and controlling its ammunition inventories at some locations. For example, it does not know how much ammunition is in storage, where it is physically located, or its actual condition. The Navy would have to perform significant inventory verifications to make reliable estimates of the ammunition in storage requiring renovation and maintenance.

The lack of reliable records is further aggravated in some locations, particularly the Pacific, by the lack of a quality assurance program. Not only are required documents missing or incorrect, but also inaccessible. In addition, the storage methods make ready access to count and inspect stored ammunition almost impossible. In our opinion, many of the weaknesses in Navy's management of ammunition stored in the Pacific are related to their policy of assigning to storage operations military personnel who lack sufficient ordnance training and expertise.

The Navy's funding for maintenance and renovation of ammunition has not kept pace with its needs to upgrade ammunition in an unserviceable condition. This is evidenced by the large percentage (almost one-third of the $6.7 billion inventory) of ammunition in an unserviceable condition on June 30, 1980. This condition may be partly due to the Navy's inability to determine and budget for, in definite terms, that ammunition which should be renovated. When inventory records have been corrected to accurately show the quantity and condition of ammunition, the Navy could then better defend the required funding.

Many of the Navy's deficiencies in ammunition management could have been improved if the recommendations in our July 29, 1981, report had been implemented. These recommendations are briefly stated below.

--Develop a program to expedite the reconciliation of the Navy's central inventory records with storage records and investigate the causes of significant adjustments.

--Develop a capability to effectively monitor the status of ammunition transactions.

--Process suspended ammunition in a more timely manner.

--Require interim accountability for ammunition designated for further transfer.

The Navy has already been requested to inform us and the appropriate committees of the Congress of the actions it has taken on these recommendations.

RECOMMENDATIONS

In addition to the above reported recommendations, the Secretary of the Navy should determine the level of ammunition needing renovation and support a budget program, over a predetermined number of years, to reduce the backlog. The Navy should emphasize or revise its ammunition quality assurance surveillance program to provide adequate inspections of ammunition at storage locations. In this respect, the Navy, as a minimum, should consider funding adequate ammunition quality assurance training

to ensure that basic storage and inventory procedures are complied with at all storage locations. Also, we believe that the Secretary should reevaluate its policy of assigning personnel who lack sufficient ordnance training and expertise to ammunition storage operations.

AGENCY COMMENTS AND OUR EVALUATION

Defense agreed that the Navy has significant problems with the management of its retail ammunition stocks in the areas of accountability, quality assurance, maintenance, and renovation. Concerning our first recommendation, the Navy acknowledged a large backlog of unserviceable ammunition and stated that, in the past, renovation and maintenance funding levels may have been reduced to provide funds for higher priority purposes. The Navy states that its unserviceable ammunition is composed of retail stocks, ammunition held in reserve for ship activation, and ammunition under the custody of the single manager for conventional ammunition. The Navy stated that if the ammunition held in reserve, and those items classified in condition code E that are stored with, and for which the maintenance should be funded by, the single manager are removed from the Navy's total amount of unserviceable ammunition, sufficient funds should be available to eliminate the remaining backlog by the end of fiscal year 1984. We believe the accomplishment of this goal would contribute markedly toward bringing the Navy's ammunition backlog under control.

Concerning our second recommendation, the Navy stated that the problems cited in our report concerning the Navy magazines in the Pacific are attributable to the Navy commands having custody of the ammunition rather than to the overall Navy quality evaluation program. As a result of our visits and congressional inquiries, the Navy stated that programs were instituted at the Navy magazines to correct the deficiencies as soon as possible, consistent with their fleet support mission role.

We proposed in our draft report that the Navy consider developing an occupational speciality such as the Army and Air Force have covering ammunition. The Navy agreed with our proposal and informed us it has established an unrestricted career field designator for officers which combines the occupational specialities of expendable ordnance management, explosive ordnance disposal, and diving and salvage. These officers will be assigned primarily to billets which deal with acquisition, storage, maintenance, and disposal of ammunition. The Navy estimated that the career field should be fully manned by 1987.

To enhance ammunition quality overseas, the Navy is also initiating steps to increase the effectiveness of the MAERUs. The Navy also provided several additional comments on specific portions of our report, mostly to clarify its positions or to furnish additional information for our consideration. Where appropriate, we have incorporated their comments in our final report.

CHAPTER 4

PROBLEMS ASSCCIATED WITH THE CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION-- DEPARTMENT OF THE AIR FORCE

Except for subjecting portions of its inventory to open storage in Europe, the Air Force was generally providing adequate physical storage for its conventional ammunition at the installations we visited. It is unfortunate that the Air Force finds it necessary to use open storage at some of its depots in Europe. These facilities are not adequately equipped to maintain and renovate stocks which deteriorate from exposure to the elements. As a result, needed maintenance of stocks has not been accomplished in a timely manner and maintenance backlogs of 1 to 3 years have accumulated on some ammunition items.

OPEN STORAGE AND MAINTENANCE PROBLEMS IN EUROPE

The Air Force's conventional ammunition is stored at both wholesale (i.e., continental United States depot) and retail levels. At the wholesale level, the Army single manager for conventional ammunition has storage responsibility for Air Force ammunition. As discussed in chapter 2, we did not observe any significant storage problems in this area. Likewise, at the Air Force base level in Europe and the Pacific, we found that covered storage facilities provided good shelter for stored ammunition. However, in Europe, the Air Force does not have sufficient covered storage and must store many items in open storage at some of its depots. The types of storage ranged from open concrete pads, to roofs over the pads, to shelters open in front. As a result, the ammunition was exposed to the corrosive elements of the weather. Although Air Force officials stated that bombs can be stored outside, inside storage is preferred. Our inspection of bombs stored outside showed that some had quite extensive rust and water in the fuze wells.

The Air Force has encountered serious difficulties in accomplishing maintenance in a timely manner at its depots in Europe. The following table shows the maintenance backlog as estimated by officials at the three major depot storage areas.

Depot location	Estimated backlog
Welford, England	2 to 3 years
Wenigerath, Germany	1-1/2 years
Camp Darby, Italy	2 years

The following examples show the types of items awaiting maintenance and the time involved.

Location	Items	Quantity	Condition code	Date coded
Welford	MXU-650/B	295	E	Oct. 78
Welford	MK 84 bombs	6,842	F	Dec. 78
Welford	MK 82 bombs	34,581	F	June 78
Welford	CBU 71/B	2,328	F	Sept. 79
Wenigerath	CBU 52	229	E	Aug. 79
Weingerath	MXU 600 A/B	295	E	Nov. 79
Wenigerath	30-mm. PGU 13/B	89,967	E	Feb. 79
Camp Darby	MXU 650/B	1,000	E	Nov. 79
Camp Darby	MK 82 bombs	3,384	E	Mar. 80
Camp Darby	FMU 54/B	2,190	E	July 80

Maintenance facilities at these depots are inadequate and the backlogs have resulted primarily because the facilities are poorly designed and not equipped for the type and volume of maintenance done. Maintenance supervisors and commanders at each of the three depot storage areas attributed their backlog problems to the lack of adequate maintenance facilities and equipment. For example, the maintenance facility at Wenigerath is a converted ammunition storage building. This building is not well suited for major corrosion control, which is the biggest maintenance problem at Wenigerath. It has no paint booth and no overhead lift equipment. In addition, it has inadequate heating and ventilation. Wenigerath officials have requested about $1 million for a new maintenance/inspection facility.

The maintenance facility at Welford is considered too small and not properly equipped for corrosion control. It has no paint booth, for example. A new maintenance facility is planned at Welford, but construction is not expected before fiscal year 1984.

Officials at Camp Darby said their maintenance facility is too small to handle the volume of maintenance which must be done. They also stated that the lack of reliable material handling equipment has greatly affected both storage and maintenance, citing that forklifts at Camp Darby are not working at least half the time.

Air Force Headquarters officials informed us that they are programing new maintenance facilities at Welford, Camp Darby, and Wenigerath, along with a new bomb renovation plant to be located at Wenigerath. In addition, 134 munitions igloos are programed for construction at main bases. If funded, this will allow some ammunition currently stored outside to be moved inside, thereby reducing maintenance actions.

CONCLUSIONS

Based on our visits to ammunition storage facilities, it appears the Air Force is, for the most part, providing good care for its conventional ammunition inventory. We did, however, observe some outside storage in Europe which may be contributing to accelerated deterioration of ammunition. This consisted mainly of rusting and water in bomb fuze wells. As is the case with the Army, there is a backlog of ammunition in Europe awaiting maintenance which could continue to grow unless action is taken to improve storage and to fund maintenance actions.

RECOMMENDATION

We recommend that the Secretary of the Air Force closely monitor the acquisition of needed additional ammunition storage and maintenance capability in Europe and take action, within the limits of available funds, to avoid slippages which would result in continued deterioration of ammunition and further accumulation of maintenance backlogs.

AGENCY COMMENTS

Defense agreed with our conclusions and recommendations.

APPENDIX I

LOCATIONS VISITED DURING GAO'S REVIEW OF DEFENSE'S CARE AND MAINTENANCE OF CONVENTIONAL AMMUNITION

U.S. ARMY

Continental United States:	U.S. Army Materiel Development and Readiness Command
	U.S. Army Depot System Command
	U.S. Army Armament Readiness Command
	U.S. Army Defense Ammunition Center and School
	Crane Army Ammunition Activity
	Lexington-Bluegrass Depot Activity
	Letterkenny Army Depot
	Tooele Army Depot
Europe:	Headquarters, U.S. Army, Europe, Federal Republic of Germany (FRG)
	21st Support Command, FRG
	Theater Army Materiel Management Center, FRG
	Headquarters, 2nd Support Command, FRG
	60th Ordnance Group, FRG
	Miesau Army Depot, FRG
	Weilerbach Ammunition Storage Area, FRG
	101st Ordnance Battalion, FRG
	63d Ordnance Company, FRG
	Ammunition Stockage Point One, FRG
	Prestock Point Eighty, FRG
	Feucht Ammunition Storage Area, FRG
	Caerwent Army Depot, South Wales
	Leghorn Army Depot, Italy
Pacific:	Central Ammunition Management Office - Pacific
	U.S. Army Support Command, Hawaii
	Naval Magazine, Lualualei, Hawaii
	Eighth U.S. Army, 19th Support Command, Korea

U.S. NAVY

Continental United States:	None 1/

1/Two Navy locations were visited during a recently completed GAO assignment concerning fleet returned ammunition and data from this previous work was applied to our current assignment.

APPENDIX I

Europe:	Commander-in-Chief, U.S. Navy, Europe, London, England
	U.S. Naval Station, Rota, Spain
	U.S. Naval Air Facility, Sigonella, Sicily, Italy
	NATO Ammunition Depot, Sigonella, Sicily, Italy
	NATO Ammunition Depot, Souda Bay, Crete, Greece
	NATO Ammunition Depot, Lisbon, Portugal
	NATO Ammunition Depot, Glen Douglas, Scotland
	Mobile Mine Assembly Group (Det. 4), Glen Douglas, Scotland
	Mobile Mine Assembly Group (Det. 5), Souda Bay, Crete, Greece
	Mobile Mine Assembly Group (Det. 6), Sigonella, Sicily, Italy
	U.S.S. Soribachi, U.S. Ammunition Ship
Pacific:	Naval Logistics Command, U.S. Pacific Fleet, Hawaii
	Naval Magazine Lualualei, Hawaii
	Naval Magazine Subic Bay, Philippines

U.S. AIR FORCE

Continental United States:	U.S. Air Force Logistics Command
	Ogden Air Logistics Center
Europe:	Headquarters, U.S. Air Force, Europe, Ramstein Air Base, FRG
	7551st Ammunition Supply Squadron, Royal Air Force, Welford, 3d Air Force, England
	40th Ammunition Supply Squadron, Camp Darby, 16th Air Force, Italy
	50th Ammunition Supply Squadron, Wenigerath, 17th Air Force, FRG
	48th Tactical Fighter Wing, Royal Air Force, Lakenheath, 3d Air Force, England
	86th Tactical Fighter Wing, Ramstein Air Base, 17th Air Force, FRG
	TUSLOG Det. 192, Incirlik, 16th Air Force, Turkey
	Royal Air Force, Wittering, England
	Norwegian Air Force, Rygge, Norway
	TUSLOG Det. 118, Izmir, 16th Air Force, Turkey
	Forward Operation Location, Germany Air Base, Ahlhorn, FRG
Pacific:	Headquarters, Pacific Air Forces, Hawaii
	15th Air Base Squadron, Naval Magazine, Lualualei, Hawaii
	400th Munitions Maintenance Squadron, Kadena Air Base, Okinawa, Japan

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